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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,230	08/30/2001	John Whitman	4294.1US (98-1208.1)	2488

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TRASK BRITT  
P.O. BOX 2550  
SALT LAKE CITY, UT 84110

EXAMINER
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DICKEY, THOMAS L

ART UNIT	PAPER NUMBER
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2826

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/06/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/944,230	<b>Applicant(s)</b> WHITMAN ET AL.	
	<b>Examiner</b> Thomas L. Dickey	<b>Art Unit</b> 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-12, 15, 16, 18-21, 23 and 25-34 is/are pending in the application.
- 4a) Of the above claim(s) 2 and 5-10 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15, 16, 18-21, 23, 25-27 and 33 is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4, 11, 12, 21, 28-32 and 34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2002 and 03 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/20/06</u> . | 6) <input type="checkbox"/> Other: _____  |

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## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114 was filed in this application after a decision by the Board of Patent Appeals and Interferences, but before the filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit or the commencement of a civil action. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on Monday 11/20/2006 (See 37 CFR §1.304. Saturday 11/18/2006 was the two-month anniversary of said decision by the Board of Patent Appeals and Interferences) has been entered.

### ***Information Disclosure Statement***

2. The Information Disclosure Statement filed on 11/20/2006 has been considered.

### ***Response to Arguments***

3. Applicant's arguments filed 11/20/06 have been fully considered but they are not persuasive.

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It is argued, at page 8 of the remarks, that "The subject matter of claim 14, which was indicated to contain subject matter that is allowable over the disclosure of Yates, has been incorporated into independent claim 15." This is a false and misleading statement. Claim 14, as previously indicated allowable, incorporated by reference all the limitations of claims 11 and 12, from which it depended. 35 USC §112, paragraph 4. Claim 14, in its entirety, included the limitations that the substrate comprise a stacked capacitor structure and the at least one recess comprise at least one container recessed in an insulator layer of said stacked capacitor structure, wherein said material layer comprises a mask material, said mask material substantially filling said at least one container, and wherein said mask material covering a surface of said insulator layer has a thickness of less than about half a depth of said at least one container. Independent claim 15 fails to incorporate these limitations. Furthermore, the version of claim 14 that was indicated to contain subject matter that is allowable over the disclosure of Yates also incorporated by reference all the limitations of claim 1. One of those limitations (material layer required to substantially fill the at least one recess) is incompatible with the limitations of claim 15.

It is argued, at page 9 of the remarks, that "The subject matter of claim 14, which was indicated to contain subject matter that is allowable over the disclosure of Kikuchi, has been incorporated into independent claim 15." This, too, is a false and misleading statement. Claim 14, as previously indicated allowable, incorporated by reference all the limitations of claims 11 and 12, from which it depended. 35 USC §112, paragraph 4.

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Claim 14, in its entirety, included the limitations that the substrate comprise a stacked capacitor structure and the at least one recess comprise at least one container recessed in an insulator layer of said stacked capacitor structure, wherein said material layer comprises a mask material, said mask material substantially filling said at least one container, and wherein mask material covering a surface of said insulator layer has a thickness of less than about half a depth of said at least one container. Independent claim 15 fails to incorporate these limitations.

It is argued, at page 10 of the remarks, that "The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides... 'suggestion... motivation... reasonable expectation of success.... teach or suggest all limitations...' Claim 4 is allowable, among other reasons, for depending indirectly from independent claim 1, which is allowable." This argument appears to be a *non-sequitor*.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

A. Claims 1,3,4, 11,12, and 21 lack enablement because applicants fails to disclose how a single material layer can substantially (i.e. approximately) fill at least one recess,

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while at the same time having a thickness of less than about half a depth of said at least one recess. Half full is clearly not "substantially" full.

The claim might be enabled if the material layer was composed of two or more sublayers ("portions") and if one of these portions (i.e., sublayers) were less than half the depth of the recess while the other was more than half the depth, with the result that the whole "double layered" material layer was substantially as thick as the depth of the recess. However, Applicants appear to the Examiner to have disavowed this reading of the claim. In the event the Examiner is wrong, a rejection of claims 1,3,4, 11,12, and 21 over such a device having a "double layered" material layer is appended.

**B.** Claims 28-32 and 34 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 28-32 require a material layer to substantially fill a remaining portion of an at least one recess, in contrast to claims 15 and 33, which require the material layer to substantially fill at least one valley located substantially over the at least one recess. The application as filed discloses at least two embodiments, note figures 7 and 12, having a material layer 38 or 48 (figures 7 and 12 respectively) substantially filling at least one valley 34 or 54 located substantially over an at least one recess 24 or 44. However, in no event (at least no event wherein the material layer is less than half as thick as the valley, as required by claims 15, 28, and

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33) does the application as filed teach that said at least one valley should form a remaining portion of an at least one recess. In all events the at least one valley is separate from and above the at least one recess. For this reason claim 34, which requires the at least one valley to be located partially within the at least one recess, is not taught by the application as filed. Claim 34 is also rejected for lack of enablement, because applicants do not teach how simultaneously form a valley both "substantially above," and "partially in," the same recess. Claim 34 is also rejected for indefiniteness under the second paragraph of 35 U.S.C. 112, because one having skill in the art could make no sense out of a claim which characterized something as simultaneously being "substantially above," and "partially in," the same recess.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1,3, 11,12, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by KIKUCHI ET AL. (6,278,153).

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Kikuchi et al. discloses a semiconductor device structure with a substantially planar surface, comprising a substrate 21-22-23-24-25 including at least one recess 23A formed therein; and a material layer 20-27 disposed over said substrate 21-22-23-24-25 and substantially filling said at least one recess 23A, said material layer 20-27 having a substantially planar surface, and portions 27 of the material layer 20-27 having a thickness of less than about half a depth of said at least one recess 23A; wherein said material layer 20-27 comprises a mask material 20, and the surface of the material layer 20-27 is free of abrasive-planarization-induced defects, wherein the substrate 21-22-23-24-25 comprises a stacked capacitor structure and the at least one recess 23A comprises at least one container 24-25 recessed in an insulator layer 23 of said stacked capacitor structure, said mask material 20 substantially filling said at least one container 24-25. Note figures 6B, 6F and column 19 lines 35-67 and column 20 lines 13-27 of Kikuchi et al.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 stands rejected under 35 U.S.C. 103(a) as being unpatentable over KIKUCHI et al. (6,278,153) in view of DENNISON et al. (5,663,090).



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Kikuchi et al. discloses a semiconductor device structure with all the limitations of claim 4 except that the substrate include at least one conductively doped region continuous with a surface of the semiconductor substrate and adjacent the at least one recess. Note figure 6F of Kikuchi et al.

However, Dennison et al. discloses a semiconductor device structure with substrate 40 including at least one conductively doped region 41 that is adjacent to a recess (the recess being filled with lower electrode 43 of a stacked capacitor structure. Note figure 4b of Dennison et al. Therefore, it would have been obvious to a person having skill in the art to replace the substrate of Kikuchi et al.'s semiconductor device structure with the substrate including at least one conductively doped region that is adjacent a recess containing a stacked capacitor structure, such as taught by Dennison et al. in order to utilize the semiconductor device structure of Kikuchi et al. alongside a MOSFET such as taught by Dennison et al. to thus utilize the semiconductor device structure of Kikuchi et al. as the capacitor of a DRAM memory.

***Allowable Subject Matter***

6. Claims 15,16,18-21,23,25-27 and 33 are allowed over the references of record because none of these references disclosed or can be combined to yield the claimed invention such as a material layer substantially filling at least one valley included in an intermediate layer, said valley located substantially over at least one recess, and said ma-

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terial layer having a thickness of less than half the depth of the at least one valley, as recited in claims 15 and 33.

**Conclusion**

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas L Dickey whose telephone number is 571-272-1913. The examiner can normally be reached on Monday-Thursday 8-6.

If attempts to reach the examiner by telephone are unsuccessful, please contact the examiner's supervisor, Sue A. Purvis, at 571-272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**Thomas L. Dickey**  
**Primary Examiner**  
**Art Unit 2826**